

### **REMARKS**

In the Office Action, the Examiner rejected claims 1-36. Applicants respectfully assert that these claims, as originally filed, are patentable and in condition for allowance. Reconsideration and allowance of all pending claims are requested.

#### **Rejections Under 35 U.S.C. § 103**

The Examiner rejected claims 1, 2, 9-13, 16-18, 21, 27-30, 34 and 35 under 35 U.S.C. § 103(a) as being unpatentable over Iyriboz et al. (U.S. Patent No. 6,369,812 B1) in view of Giebeler (U.S. Patent No. 5,787,146). The Examiner also rejected claims 3-8, 14, 15, 19, 20, 22-26, 31-33 and 36 under 35 U.S.C. § 103(a) as being unpatentable over Iyriboz et al. and Giebeler in view of Deckman et al. (U.S. Patent No. 4,891,829). Applicants respectfully traverse these rejections.

The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). Accordingly, to establish a *prima facie* case, the Examiner must not only show that the combination includes *all* of the claimed elements, but also a convincing line of reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985).

The Iyriboz et al. reference, which discloses an interactive graphical rendering device, and the Giebeler reference, which discloses a crystal X-ray diffraction system, never mention the determination of whether a projection area falls within a detector framework or boundaries as disclosed by the present application. Additionally, unlike the present application, the references do not address the situation of an image area different

in size than the detector boundaries. In further contrast, neither reference discloses an asymmetrical projection upon an image plane. Therefore, as discussed below, Applicants respectfully submit that the subject matter of independent claims 1, 11, 21 and 30, as well as their respective dependent claims, is patentable over the references cited by the Examiner. Accordingly, Applicants request withdrawal of the Examiner's rejections and allowance of claims 1-36.

Independent claim 1 recites a method for cropping an *asymmetrical* digital image. The method includes steps for identifying a projection of a radiation beam in an image plane and processing, *on the basis of* the identified projection, image data for a *portion* of a digital detector. Further, the claim explicitly states the projection identified is asymmetrical with respect to an axis of the image plane.

The Examiner rejected claim 1 based upon the Iyriboz et al. and Giebeler references. The Examiner contends that the Iyriboz et al. reference discloses a medical diagnostic system that provides for cropping an asymmetrical digital image. The Examiner further contends that the reference discloses steps for such asymmetric cropping that include identification of a projection of a radiation beam in an image plane and processing image data for a portion of a digital detector based upon the identified projection. The Examiner also relies upon the Giebeler reference, which the Examiner believes to disclose a projection of a radiation beam in an image plane that is asymmetrical with respect to an axis of the image plane. However, each of these assertions is based upon mistaken characterizations of passages from the cited references.

The Iyriboz et al. reference is primarily concerned with converting two-dimensional images, such as those produced by medical diagnostic equipment, into three-dimensional, interactive presentations. Column 1, lines 10-17. The disclosed system includes a CT scanner 12 which examines a subject 14, and generates data from the examination. Column 5, lines 35-39. *All* of the data is then stored in a volume image

data memory 20. Column 5, lines 39-40. After the data has been sampled and saved in memory, a three-dimensional view may be graphically rendered from these two-dimensional images by means of a sequence generating computer 22, which includes a frame rendering processor 74, an image memory access processor 76, and a ray projection processor 78. Column 5, lines 40-43; column 6, lines 60-66. Three-dimensional views are constructed by first creating, from the stored data, a sequence of two-dimensional source images 170, which are then cropped and curved into a generally spherical shape, representing a panoramic first-person perspective. Column 8, line 49 – column 9, line 22.

In rejecting claim 1, the Examiner relies on column 10, lines 16-28, of the Iyriboz et al. reference as showing a method for “cropping an asymmetrical digital image” as recited in the claim. In fact, while this passage does relate to general cropping of images, reference to the preceding twenty lines makes clear that the partial images 238 that are cropped to form output image 242 are square, flat, and thus *necessarily symmetrical*. Column 9, line 65 – column 10, line 3. This is directly contrary to the recitation of claim 1, which addresses the cropping of *asymmetric* images.

The Examiner cites several passages of the Iyriboz et al. reference as indicative of “identifying a projection of a radiation beam in an image plane” as recited in claim 1. However, none of the passages cited by the Examiner show a radiation beam, a projection of that beam in an image plane, or identification of such a projection. In accordance with the Applicants’ characterization of the reference above, the cited passages of the reference disclose a frame rendering processor 74 or 182 that controls, among other things, a ray projection processor 78 or 184. This ray projection processor *calculates* a plurality of rays from a viewing plane through a three-dimensional array of stored image data. There is one ray calculated for each pixel of the viewing screen, which is “projected” orthogonally from the screen. However, it is an entirely computational process. See column 6, line 60 – column 7, line 11; column 9, lines 15-22. The rays referred to are not part of any radiation beam, but are rays in a purely mathematical sense: a half-line

extending from a point in space. Further, because these rays are merely mathematical constructs having no physical form, these abstract rays cannot be projected into an image plane. Additionally, the Examiner has failed to point out any portion of the reference in which “identification” occurs. For these reasons, the reference cannot fairly be characterized as disclosing the step of “identifying a projection of a radiation beam in an image plane” as recited by independent claim 1.

The Iyriboz et al. reference also fails to disclose “processing image data for a portion of a digital detector *based upon the identified projection*” (emphasis added) as recited by rejected claim 1. As discussed immediately above, the reference does not identify a projection of a radiation beam in an image plane at all. Consequently, it is not possible for the reference to disclose the processing of image data *based upon the identified projection*.

The Examiner recognizes that the Iyriboz et al. reference is silent with respect to the identified projection of a radiation beam in the image plane being asymmetrical. The Examiner relies upon the Giebeler reference to overcome this deficiency. However, the only discussion of asymmetry in the Giebeler reference is the asymmetrical orientation of the crystalline structural planes with respect to the physical surface of the crystal. Column 8, lines 30-41. The cited reference fails to disclose “the projection being asymmetrical with respect to an axis of the image plane,” as recited by rejected claim 1. Indeed, the reference does not disclose asymmetrical imaging at all. The portion of the reference (column 8, lines 19-28) cited by the Examiner has nothing to do with the image plane or asymmetrical imaging. The cited text describes electrons discharging from a cathode and hitting an X-ray generating source (such as a rotating anode target). Thus, the text discusses the X-ray source, a part of the disclosed system *far upstream of the image plane*.

With respect to independent claims 11 and 21 of the present application, Applicants respectfully disagree that the portions of the Iyriboz et al. and Giebeler reference cited by the Examiner disclose the recited features of claims 11 and 21. Several examples of the failure of these references to disclose the subject matter of the claims are given below. For instance, neither reference discloses “computing an image area over which the beam impinges the plane” as recited by independent claims 11 and 21. The Examiner cites column 5, lines 50-64, of the Iyriboz et al. reference as satisfying this element, but this passage merely indicates that radiation detectors 44 are positioned to measure radiation directed toward the same detectors. The reference only discloses the measurement of radiation by the detectors 44 and the storing of all data received in a volume image data memory 20; it *does not* indicate any means for computing an image area over which the beam impinges the plane.

Further, neither reference discloses orienting a radiation beam or assembly to project a beam “towards an image plane to impinge the plane asymmetrically with respect to an axis of the plane,” as recited by claims 11 and 21. The Examiner again relies on the Giebeler reference as showing this asymmetrical impingement. As discussed fully above, the only discussion of asymmetry in the Giebeler reference is with respect to the crystal configuration, not to a beam within the image plane. The Giebeler reference simply does not support the Examiner’s assertion on this issue.

Additionally, neither reference discloses a method that includes the step of “sensing orientation of the radiation beam producing assembly” as recited in claim 21. As discussed previously, the Iyriboz et al. reference is primarily directed toward three-dimensional rendering of images from two-dimensional source images. The Examiner suggests that a passage found at column 8, lines 24-43, discloses this element. Applicants have carefully reviewed the passage and the reference as a whole. The Iyriboz et al. reference does not appear to disclose any such step. The passage cited discusses certain means for limiting image distortion when changing perspective (which is attributable to

creating a spherical, panoramic view from a plurality of flat images) in the rendered three-dimensional setting. While the passage does contain the word “orientation,” this is used merely in discussing changes in viewing perspective from two different points. There is no radiation beam producing assembly at all, and it is thus impossible that the reference discloses “sensing orientation of the radiation beam producing assembly.”

As for independent claim 30, the Examiner stated that the rejection analysis is the same as that for independent claim 21. Claim 30 is thus also believed patentable over the cited references for the same reasons that apply to claim 21 above. Applicants further assert, however, that the Iyriboz et al. and Giebeler references also fail to fully disclose the subject matter of independent claim 30. For example, the references do not disclose a radiation source assembly that is “orientable with respect to an imaging plane to produce an asymmetrical image area,” as recited by claim 30. Indeed, the source and detector of the Giebeler reference appear to be coupled, therefore moving in synchrony. *See* Figs. 3 and 4. Such a configuration does not disclose or suggest the ability to produce an asymmetrical image area. The reference never mentions an “asymmetrical image area.” As indicated above, the only discussion of asymmetry in the reference is with respect to crystalline structure and orientation of the crystals in an array. As for the detector, the reference mentions that segmenting the detector and using an asymmetrical orientation of the crystals allows the array to be curved to minimize geometric aberrations in the image reconstruction, and facilitates maximization of the data transfer rate. Column 7, lines 60-67. The asymmetry discussed in Giebeler, unlike the present claims, clearly has nothing to do with the imaging area or imaging plane, but instead is applied in the crystal configuration. Similarly, the reference fails to anticipate a control circuit to process image data from the detector “*to the exclusion of* data from portions of the imaging surface outside the image area,” (emphasis added) as recited by claim 30.

In view of the remarks set forth above, Applicants respectfully submit that the independent claims 1, 11, 21, and 30 are patentable over the Giebeler and Iyriboz et al.

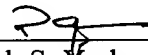
references. Dependent claims 2, 9, 10, 12, 13, 16-18, 27-29, 34, and 35 were rejected on the basis of these two references. Dependent claims 3-8, 14, 15, 19, 20, 22-26, 31-33, and 36 were also rejected by the Examiner on the basis of these two references combined with the Deckman et al. reference. However, the Deckman et al. reference does nothing to obviate the deficiencies of the two references discussed above. Consequently, all of these dependent claims are believed allowable by virtue of their dependency on their respective allowable base claim, as well as for the subject matter recited in these claims. Accordingly, Applicants respectfully request withdrawal of the Examiner's rejections and allowance of claims 1-36.

**Conclusion**

In view of the remarks and amendments set forth above, Applicants respectfully request allowance of the pending claims. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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